IN THE CLAIMS:

Claims 1-15 (Canceled)

16. (Currently Amended) ~~The method of Claim 1~~ A method for monitoring patient cardiac signals and the contraction and expansion of the heart chambers during heart cycles and processing such signals within an implantable medical device (IMD) to provide data related to the mechanical performance of the heart comprising:

implanting a magnetic field strength sensor at a sensor site in or on a first heart chamber;

implanting a magnetic field generator that generates a magnetic field at a magnet site in or on a second heart chamber displaced from the sensor site at a distance that fluctuates with the contraction and expansion of at least the first heart chamber; and

operating the magnetic field strength sensor during at least a portion of the heart cycle to develop a sensor output signal having a magnitude and rate of change in magnitude dependent upon the magnetic field strength of the magnetic field directly related to the distance between the magnet and sensor sites that fluctuates with the contraction and expansion of one or both of the first heart chamber and second heart chamber, whereby the output signal magnitude or rate of change of magnitude is representative of the mechanical performance of the heart chamber, wherein the implantable medical device comprises an implantable pacing system, and further comprising:

delivering first and second pacing pulses separated in time by a pace delay to the first and second heart chambers, respectively, wherein the first and second heart chambers are right and left heart chambers, to elicit synchronized contractions of the first and second heart chambers;

conducting the operating step after delivery of the pacing pulse; and

adjusting the timing of delivery of the first and second pacing pulses as a function of the determined distance during a heart cycle following delivery of first

and second pacing pulses to maximize the value of a weighted combination of the systolic shortening of the distance and the inverse of the end diastolic distance for a given heart rate.

17. (Currently Amended) ~~The method of Claim 1~~ A method for monitoring patient cardiac signals and the contraction and expansion of the heart chambers during heart cycles and processing such signals within an implantable medical device (IMD) to provide data related to the mechanical performance of the heart comprising:

implanting a magnetic field strength sensor at a sensor site in or on a first heart chamber;

implanting a magnetic field generator that generates a magnetic field at a magnet site in or on a second heart chamber displaced from the sensor site at a distance that fluctuates with the contraction and expansion of at least the first heart chamber; and

operating the magnetic field strength sensor during at least a portion of the heart cycle to develop a sensor output signal having a magnitude and rate of change in magnitude dependent upon the magnetic field strength of the magnetic field directly related to the distance between the magnet and sensor sites that fluctuates with the contraction and expansion of one or both of the first heart chamber and second heart chamber, whereby the output signal magnitude or rate of change of magnitude is representative of the mechanical performance of the heart chamber, wherein the implantable medical device comprises an implantable pacing system, and further comprising:

delivering a first pacing pulse to the left ventricle (LV) and a second pacing pulse to the right ventricle (RV) separated in time by a V-V pace delay to elicit synchronized contractions of the right and left ventricles;

conducting the operating step after delivery of the pacing pulse; and

adjusting the V-V pace delay as a function of the determined distance between to maximize the value of a weighted combination of the systolic

shortening of th RV-LV distance and the inverse of the nd diastolic distance for a given heart rate.

18. (Currently Amended) ~~The method of Claim 1~~ A method for monitoring patient cardiac signals and the contraction and expansion of the heart chambers during heart cycles and processing such signals within an implantable medical device (IMD) to provide data related to the mechanical performance of the heart comprising:

implanting a magnetic field strength sensor at a sensor site in or on a first heart chamber;

implanting a magnetic field generator that generates a magnetic field at a magnet site in or on a second heart chamber displaced from the sensor site at a distance that fluctuates with the contraction and expansion of at least the first heart chamber; and

operating the magnetic field strength sensor during at least a portion of the heart cycle to develop a sensor output signal having a magnitude and rate of change in magnitude dependent upon the magnetic field strength of the magnetic field directly related to the distance between the magnet and sensor sites that fluctuates with the contraction and expansion of one or both of the first heart chamber and second heart chamber, whereby the output signal magnitude or rate of change of magnitude is representative of the mechanical performance of the heart chamber, wherein the implantable medical device comprises an implantable pacing system, and further comprising:

delivering a first pacing pulse to the atria and a second pacing pulse to the ventricles to at least one of the right ventricle (RV) and the left ventricle (LV) separated in time by an AV delay to elicit synchronized contractions of the atria and ventricles;

conducting the operating step after delivery of the pacing pulse; and

adjusting the AV delay as a function of the determined distance to maximize the value of a weighted combination of the systolic shortening of the

RV-LV distance and the inverse of the end diastolic distance for a given heart rate.

Claims 19-35. (Canceled)

36. (Currently Amended) ~~The system of Claim 21~~ A system for monitoring patient cardiac signals and the contraction and expansion of the heart chambers during heart cycles and processing such signals within an implantable medical device (IMD) to provide data related to the mechanical performance of the heart comprising:

a magnetic field strength sensor located at a sensor site in or on a first heart chamber;

a magnetic field generator that generates a magnetic field located at a magnet site in or on a second heart chamber displaced from the sensor site at a distance that fluctuates with the contraction and expansion of the heart chambers; and

means for operating the magnetic field strength sensor during at least a portion of the heart cycle to develop a sensor output signal having a magnitude and rate of change of magnitude dependent upon the magnetic field strength of the magnetic field directly related to the distance between the magnet and sensor sites that fluctuates with the contraction and expansion of the heart chambers, whereby the output signal magnitude or rate in change of magnitude is representative of the mechanical performance of the heart chambers, wherein the implantable medical device comprises an implantable pacing system, and further comprising:

means for delivering first and second pacing pulses separated in time by a pace delay to the first and second heart chambers, respectively, wherein the first and second heart chambers are right and left heart chambers, to elicit synchronized contractions of the first and second heart chambers; and

means for adjusting the timing of delivery of the first and second pacing pulses as a function of the determined distance during a heart cycle following delivery of first and second pacing pulses to maximize the value of a weighted combination of the systolic shortening of the distance and the inverse of the end diastolic distance for a given heart rate.

37. (Currently Amended) ~~The system of Claim 21~~ A system for monitoring patient cardiac signals and the contraction and expansion of the heart chambers during heart cycles and processing such signals within an implantable medical device (IMD) to provide data related to the mechanical performance of the heart comprising:

a magnetic field strength sensor located at a sensor site in or on a first heart chamber;

a magnetic field generator that generates a magnetic field located at a magnet site in or on a second heart chamber displaced from the sensor site at a distance that fluctuates with the contraction and expansion of the heart chambers; and

means for operating the magnetic field strength sensor during at least a portion of the heart cycle to develop a sensor output signal having a magnitude and rate of change of magnitude dependent upon the magnetic field strength of the magnetic field directly related to the distance between the magnet and sensor sites that fluctuates with the contraction and expansion of the heart chambers, whereby the output signal magnitude or rate in change of magnitude is representative of the mechanical performance of the heart chambers, wherein the implantable medical device comprises an implantable pacing system, and further comprising:

means for delivering a first pacing pulse to the left ventricle (LV) and a second pacing pulse to the right ventricle (RV) separated in time by a V-V pace delay to elicit synchronized contractions of the right and left ventricles; and

means for adjusting the V-V pace delay as a function of the determined distance between to maximize the value of a weighted combination of the systolic shortening of the RV-LV distance and the inverse of the end diastolic distance for a given heart rate.

38. (Currently Amended) ~~The system of Claim 21~~ A system for monitoring patient cardiac signals and the contraction and expansion of the heart chambers during heart cycles and processing such signals within an implantable medical device (IMD) to provide data related to the mechanical performance of the heart comprising:

a magnetic field strength sensor located at a sensor site in or on a first heart chamber;

a magnetic field generator that generates a magnetic field located at a magnet site in or on a second heart chamber displaced from the sensor site at a distance that fluctuates with the contraction and expansion of the heart chambers; and

means for operating the magnetic field strength sensor during at least a portion of the heart cycle to develop a sensor output signal having a magnitude and rate of change of magnitude dependent upon the magnetic field strength of the magnetic field directly related to the distance between the magnet and sensor sites that fluctuates with the contraction and expansion of the heart chambers, whereby the output signal magnitude or rate in change of magnitude is representative of the mechanical performance of the heart chambers, wherein the implantable medical device comprises an implantable pacing system, and further comprising:

means for delivering a first pacing pulse to the atria and a second pacing pulse to the ventricles to at least one of the right ventricle (RV) and the left ventricle (LV) separated in time by an AV delay to elicit synchronized contractions of the atria and ventricles; and

means for adjusting the AV delay as a function of the determined distance to maximize the value of a weighted combination of the systolic shortening of the RV-LV distance and the inverse of the end diastolic distance for a given heart rate.

Claims 39-40. (Canceled)

41. (Original) In a multi-site, cardiac pacing system having memory for storing data and wherein ventricular pacing pulses are delivered to first and second ventricular sites synchronously within a V-V pace delay at a predetermined pacing rate in accordance with the steps of:

implanting ventricular pace/sense electrodes at the first and second ventricular sites;

timing a ventricular pacing escape interval;

detecting a ventricular depolarization at a selected one of the first and second ventricular sites within the pacing escape interval and, in response, terminating the pacing escape interval and providing a first ventricular sense (VS) event;

delivering a first ventricular pace (VP) pulse to the selected one of the first and second ventricular sites upon either the time-out of the pacing escape interval without provision of a first VS event or upon provision of the first VS event during time-out of the pacing escape interval;

timing the V-V pace delay from a first VS event occurring prior to the time-out of the pacing escape interval or from a first VP pulse delivered either upon provision of the first VS event or upon time-out of the pacing escape interval; and

delivering a second VP pulse to the other of the first and second ventricular sites upon the time-out of the V-V pace delay, whereby VP pulses are delivered to the first ventricular site and to the second ventricular sites at a V-V pace delay selected to enhance ventricular mechanical performance;

a method of periodically deriving trend data representative of the state of heart failure as evidenced by ventricular mechanical performance during the delivery of the VP pulses comprising the steps of:

implanting a magnetic field strength sensor at a sensor site in relation to the first ventricular site;

implanting a magnetic field generator that generates a magnetic field at a magnet site in relation to the second ventricular site and displaced from the sensor site at a distance that fluctuates with the contraction and expansion of the ventricles;

operating the magnetic field strength sensitive means during at least a portion of the heart cycle to develop a sensor output signal having a magnitude dependent upon the magnetic field strength of the magnetic field directly related to the distance between the magnet and sensor sites that fluctuates with the contraction and expansion of the ventricles, whereby the output signal magnitude is representative of the mechanical performance of the heart chambers; and

storing the sensor output signal in memory, whereby trend data representative of the state of heart failure as evidenced by changes in the stored one of the elapsed VS-VS conduction time, the VP-VS conduction time, and the VS/VP-VS conduction time between the first and second ventricular sites is accumulated for analysis of the trend.

Claims 42-57. (Canceled)